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10/797,561	03/11/2004	Jose Nunez-Regueiro	3691-662	4822

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ARLINGTON, VA 22203

EXAMINER
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BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/797,561

Applicant(s)

NUNEZ-REGUEIRO ET AL.

Examiner

Gwendolyn Blackwell

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/04; 8/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 28 of copending Application No. 10/645,838. Although the conflicting claims are not identical, they are not patentably distinct from each other because the structure of claim 1 of the present application completely encompasses the claimed structure of copending claim 28.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1 and 12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 12 of copending Application No. 10/914,636. Although the conflicting claims are not identical, they are not patentably distinct from each other because the structures of claims 1 and 12 of the copending application completely encompass~~es~~ the claimed structures of claims 1 and 12, respectively, of the present application.

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

5. Claims 13 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 is indefinite because it further limits claim 12 by incorporating another IR reflecting layer and another layer comprising zinc oxide without providing one with where in the coating structure the additional IR reflecting and zinc oxide layers should be placed. For purposes of examination, the additional IR reflecting and zinc oxide layers will be considered to be placed below the first IR reflecting layer, wherein the zinc oxide is the first layer with the IR reflecting layer located between the zinc oxide layer and the silicon nitride layer.

Claim 22 is indefinite because the claim does not provide a structure layout wherein one would know where the first and second IR reflecting layers should be placed in relation to each other. For purposes of examination, the other Ag layer can be located above the first Ag layer or below the tin oxide layer.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

*(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.*

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

7. Claims 22-29 are rejected under 35 U.S.C. 102(b) as being anticipated by United States

Patent no. 6,045,896, Boire et al.

Applicant's claim 22 requires that the following structure is comprised of:

tin oxide/zinc oxide/Ag

wherein one IR reflecting layer (Ag) is directly on and contacting a layer comprising zinc oxide and the zinc oxide layer is directly on and contacting a layer comprising tin oxide. The other Ag layer can be located above the first Ag layer or below the tin oxide layer. Claim 22 also requires further limitations regarding physical characteristics related to heat treating.

***Regarding claim 22***

Boire et al disclose a glazing assembly comprised of a transparent substrate with a multilayer coating formed thereon, (column 1, lines 8-14). Table 1 discloses the following structure, (column 11), meeting the requirements of claim 22:

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TABLE 1		EXAMPLE 1	EXAMPLE 2	EXAMPLE 3
Glass	(1)	—	—	—
SnO <sub>2</sub>	(2a)	20	20	20
ZnO	(2b)	17	17	17
Ag	(3)	9	9	9
Nb	(4)	0.7	0.7	0.7
Si <sub>3</sub> N <sub>4</sub>	(5a)	65	65	65
ZnO	(5b)	25	25	35
Ag	(6)	9	9	9
Nb	(7)	0.7	0.7	0.7
Layer 8a	(8a)	(WO <sub>3</sub> ): 2	(ZnO): 2	(SnO <sub>2</sub> ): 2
Si <sub>3</sub> N <sub>4</sub>	(8b)	37.5	37.5	37.5

When the structure recited in the reference is substantially identical to that of the claims, the claimed properties or function are presumed inherent. *MPEP 2112.01*. Because the prior art exemplifies the applicant's claimed multilayer coating, the claimed physical properties relating to heat treatment, visible light transmission parameters and sheet resistance are inherently present in the prior art. Absent an evidentiary showing to the contrary, the addition of the claimed physical properties to the claim language fails to provide patentable distinction over the prior art of record, meeting the requirements of claims 22-29.

8. Claims 22-35 are rejected under 35 U.S.C. 102(a) as being anticipated by United States Patent no. 6,632,491, Thomsen et al.

The limitations of claim 22 have been set forth above.

Applicant's claims 30 and 35 require that the following structure is comprised of:

Ag/tin oxide/Ag

wherein the first and second IR reflecting layers are spaced apart by at least one layer comprising tin oxide. Each claim further requires certain physical characteristics relating to heat treating.

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*Regarding claims 22-35*

Thomsen et al disclose an IG window unit comprised of glass substrates having a multilayer coating formed between the two substrates, (column 1, lines 48-62). The solar management coating (low-E coating) is heat treatable, (column 6, lines 43-61). Table 3 (column 10) discloses the following layer structure, meeting the requirements of claim 22, 30 and 35:

Layer	Preferred Range (Å)	More Preferred Range (Å)	Example (Å)
TiO <sub>2</sub> (layer 43)	0-700 Å	100-400 Å	200 Å
ZnO <sub>x</sub> (layer 47)	25-200 Å	40-150 Å	90 Å
Ag (layer 49)	50-250 Å	80-120 Å	130 Å
NiCrO <sub>x</sub> (layer 51)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 53)	0-1,000 Å	500-900 Å	680 Å
ZnO <sub>x</sub> (layer 57)	25-200 Å	40-150 Å	90 Å
Ag (layer 59)	50-250 Å	80-220 Å	168 Å
NiCrO <sub>x</sub> (layer 61)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 62)	0-500 Å	70-200 Å	125 Å
Si <sub>3</sub> N <sub>4</sub> (layer 63)	0-500 Å	120-320 Å	220 Å

Because the prior art exemplifies applicant's claimed multilayer coating, the claimed physical properties relating to heat treatment, visible light transmission parameters and sheet resistance are inherently present in the prior art, meeting the requirements of claims 22-35. *MPEP 2112.01.*

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-7, 11-17, 21, and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 6,632,491, Thomsen et al as applied to claim 35 above.

Applicant's claim 1 requires a layer structure comprising:

dielectric/1<sup>st</sup> IR/silicon nitride/tin oxide/zinc oxide/2<sup>nd</sup> IR/dielectric

wherein the tin oxide is contacting the silicon nitride, the zinc oxide is contacting the tin oxide, and the second IR layer is contacting the layer comprising zinc oxide.

Applicant's claim 12 requires a layer structure comprising:

silicon nitride/tin oxide/zinc oxide/IR/dielectric

wherein the tin oxide is contacting the silicon nitride, the zinc oxide is contacting the tin oxide, and the IR layer is contacting the zinc oxide.

The limitations for claim 35 have been set forth above.

Applicant's claim 37 requires a layer structure comprising:



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1<sup>st</sup> dielectric/1<sup>st</sup> Ag/1<sup>st</sup> silicon nitride/1<sup>st</sup> metal oxide/1<sup>st</sup> zinc oxide/2<sup>nd</sup> Ag/another dielectric wherein the 1<sup>st</sup> metal oxide is contacting the silicon nitride, the 1<sup>st</sup> zinc oxide is contacting the 1<sup>st</sup> metal oxide, and the 2<sup>nd</sup> Ag layer is contacting the 1<sup>st</sup> zinc oxide layer.

*Regarding claim 1*

Thomsen et al disclose an IG window unit comprised of glass substrates having a multilayer coating formed between the two substrates, (column 1, lines 48-62). Table 3 (column 10) discloses the following layer structure:

TABLE 3			
(Example Materials/Thicknesses: FIGS. 5-6 Embodiment)			
Layer	Preferred Range (Å)	More Preferred Range (Å)	Example (Å)
TiO <sub>2</sub> (layer 43)	0-700 Å	100-400 Å	200 Å
ZnO <sub>x</sub> (layer 47)	25-200 Å	40-150 Å	90 Å
Ag (layer 49)	50-250 Å	80-120 Å	130 Å
NiCrO <sub>x</sub> (layer 51)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 53)	0-1,000 Å	500-900 Å	580 Å
ZnO <sub>x</sub> (layer 57)	25-200 Å	40-150 Å	90 Å
Ag (layer 59)	50-250 Å	80-220 Å	168 Å
NiCrO <sub>x</sub> (layer 61)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 62)	0-500 Å	70-200 Å	125 Å
Si <sub>3</sub> N <sub>4</sub> (layer 63)	0-500 Å	120-320 Å	220 Å

Thomsen et al also disclose that other layers may be added above, below, or there between the layers of the coating stack set forth above, (column 8, lines 22-32). Thomsen et al does not specifically disclose that a silicon nitride layer is formed between the IR layer and the tin oxide layer.

As it known in the art that silicon nitride can be used in low-E coating as a haze reducer in the final product, it would have been within the skill of one in the art at the time of invention

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to modify the coating structure of Table 3 with the addition of silicon nitride placed between the 1<sup>st</sup> IR layer and the tin oxide in order to reduce haze and/or improve the mechanical durability, (column 7, lines 14-18).

*Regarding claims 2-3, 5-7, and 11*

Table 3 demonstrates that zinc oxide can be placed below the 1<sup>st</sup> IR layer. Aluminum is added to zinc oxide during the deposition process, (column 9, lines 52-62), (claim 2). The solar management coating (low-E coating) is heat treatable, (column 6, lines 43-61), (claim 3). The first dielectric layer (layer 43) can be titanium oxide or silicon nitride, (column 9, lines 29-35), (claim 5). Layer 63 (another dielectric layer) is comprised of silicon nitride, (Table 3), (claim 6). The silicon nitride layers can be Si-rich silicon nitride layers wherein the silicon nitride is comprised of  $\text{Si}_x\text{N}_y$  having a ratio of  $x/y$  of 0.75-1.5, (column 9, lines 31-34), (claim 7). According to Table 1, it is preferred that the IG window unit have a visible transmission of at least 60% with a SHGC value of less than or equal to 0.40, (column 6, Table 1), (claim 11).

*Regarding claim 12*

A general structure of an IG window unit is demonstrated as set forth in Table 2, (column 8), below:

TABLE 2			
(Example Materials/Thicknesses: FIG. 3 coating)			
Layer	Preferred Range (Å)	More Preferred Range (Å)	Example (Å)
TiO <sub>2</sub> (layer 13)	0-400 Å	50-250 Å	100 Å
Si <sub>3</sub> N <sub>4</sub> (layer 15)	0-400 Å	50-250 Å	170 Å
NiCrO <sub>x</sub> (layer 17)	5-100 Å	10-50 Å	18 Å
Ag (layer 19)	50-250 Å	80-120 Å	105 Å
NiCrO <sub>x</sub> (layer 21)	5-100 Å	10-50 Å	16 Å
SnO <sub>2</sub> (layer 23)	0-800 Å	500-850 Å	650 Å
Si <sub>3</sub> N <sub>4</sub> (layer 25)	0-800 Å	50-250 Å	170 Å
NiCrO <sub>x</sub> (layer 27)	5-100 Å	10-50 Å	18 Å
Ag (layer 29)	50-250 Å	80-120 Å	105 Å
NiCrO <sub>x</sub> (layer 31)	5-100 Å	10-50 Å	16 Å
SnO <sub>2</sub> (layer 33)	0-500 Å	100-300 Å	150 Å
Si <sub>3</sub> N <sub>4</sub> (layer 35)	0-500 Å	100-300 Å	250 Å

Thomsen et al also disclose that other layers may be added above, below, or there between the layers of the coating stack set forth above, (column 8, lines 22-32). Thomsen et al do not specifically disclose an additional layer of tin oxide or zinc oxide between the first Ag layer and the substrate.

The first dielectric layer can be titanium oxide as demonstrated in Table 3 or tin oxide which would also function as an antireflection layer, (column 9, lines 29-35). Zinc oxide can be substituted for the NiCr oxide of the lower contact layer column 9, lines 52-62). As the tin oxide is set forth as a functional equivalent, it would have been within the skill of one in the art to substitute the tin oxide for the titanium oxide for the antireflection layer as an alternative embodiment.

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It would also be within the skill of one in the art at the time of invention to substitute the zinc oxide for the NiCr oxide layer as the lower contact layer with the Ag layer in order to increase the visible transmission and reduce the sheet resistance, (columns 9-10, lines 65-13).

*Regarding claims 13-17 and 21*

Table 2 demonstrates that another layer of zinc oxide and tin oxide are located in the coating stack, (claim 13). The solar management coating (low-E coating) is heat treatable, (column 6, lines 43-61), (claim 14). Another set of layers comprising silicon nitride on tin oxide can be found at layers 23/25, (column 8, Table 2), (claim 15). Layer 35 (another dielectric layer) is comprised of silicon nitride, (Table 2), (claim 16). The silicon nitride layers can be Si-rich silicon nitride layers wherein the silicon nitride is comprised of  $\text{Si}_x\text{N}_y$  having a ratio of  $x/y$  of 0.75-1.5, (column 9, lines 31-34), (claim 17). According to Table 1, it is preferred that the IG window unit have a visible transmission of at least 60% with a SHGC value of less than or equal to 0.40, (column 6, Table 1), (claim 21).

*Regarding claim 36*

The limitations of claim 35 have been set forth above. Table 3 demonstrates that the tin oxide has a layer of zinc oxide formed thereon. Thomsen et al does not specifically disclose that the tin oxide is formed on silicon nitride.

As it known in the art that silicon nitride can be used in low-E coating as a haze reducer in the final product, it would have been within the skill of one in the art at the time of invention to modify the coating structure of Table 3 with the addition of silicon nitride placed between the 1<sup>st</sup> IR layer and the tin oxide in order to reduce haze and/or improve the mechanical durability, (column 7, lines 14-18).

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*Regarding claim 37*

Table 3 demonstrates that the tin oxide (metal oxide) has a layer of zinc oxide formed thereon. Thomsen et al does not specifically disclose that the tin oxide is formed on silicon nitride.

As it known in the art that silicon nitride can be used in low-E coating as a haze reducer in the final product, it would have been within the skill of one in the art at the time of invention to modify the coating structure of Table 3 with the addition of silicon nitride placed between the 1<sup>st</sup> IR layer and the tin oxide in order to reduce haze and/or improve the mechanical durability, (column 7, lines 14-18).

*Regarding claims 38-40*

Below the 1<sup>st</sup> Ag layer a layer of zinc oxide is formed, (Table 3). Aluminum is added to zinc oxide during the deposition process, (column 9, lines 52-62), (claim 38). The solar management coating (low-E coating) is heat treatable, (column 6, lines 43-61), (claim 39). The metal oxide layer located between the 1<sup>st</sup> and 2<sup>nd</sup> Ag layers is tin oxide, (Table 3), (claim 40).

12. Claims 1, 8-10, 12, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Application Publication no. 2003/0150711, Laird in view of United States Patent Application Publication no. 2002/0064662, Lingle et al.

The structural requirements for claims 1 and 12 have been set forth above.

*Regarding claims 1 and 8-10*

Laird discloses a coated article having a high visible transmission and low emissivity wherein an example of the coating has the following structure:

TABLE 1			
(Example Materials/Thicknesses: FIG. 1 Embodiment)			
Layer	Preferred Range (Å)	More Preferred (Å)	Example (Å)
TiO <sub>2</sub> (layer 3)	0-700 Å	100-400 Å	200 Å
ZnO <sub>x</sub> (layer 7)	25-200 Å	40-150 Å	90 Å
Ag (layer 9)	50-250 Å	80-200 Å	130 Å
NiCrO <sub>x</sub> (layer 11)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 13)	0-1,000 Å	500-900 Å	680 Å
ZnO <sub>x</sub> (layer 17)	25-200 Å	40-150 Å	90 Å
Ag (layer 19)	50-250 Å	80-220 Å	168 Å
NiCrO <sub>x</sub> (layer 21)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 23)	0-500 Å	70-200 Å	125 Å
Si <sub>3</sub> N <sub>4</sub> (layer 25)	0-500 Å	120-320 Å	220 Å

wherein the sheet resistance is more preferred below or equal to 2.8 ohms/sq, (page 4, Tables 1 and 2), having a visible light transmission greater than or equal to 75%, (page 4, Table 3). Laird does not specifically teach that a layer of silicon nitride is provided between the 1<sup>st</sup> tin oxide and the NiCr oxide.

Lingle et al disclose that silicon nitride and in particular Si-rich silicon nitride function to reduce haze in the final product as well as when used in conjunction with a zinc oxide layer and NiCr oxide layer it can lower the sheet resistance, (page 4, section 0075).

Laird and Lingle et al disclose analogous inventions related to coated substrates which can be used as a monolithic substrate or an IG unit. It would have been within the skill of one in the art at the time of invention to modify the layer structure of Laird with the silicon nitride film of Lingle et al in order to reduce the haze of the coated article as well as lowering the sheet resistance of the coated article, (Lingle, page 4, section 0075).

*Regarding claims 12 and 18-20*

Laird discloses a coated article having a high visible transmission and low emissivity wherein an example of the coating has the following structure:

TABLE 1			
(Example Materials/Thicknesses: FIG. 1 Embodiment)			
Layer	Preferred Range (Å)	More Preferred (Å)	Example (Å)
TiO <sub>2</sub> (layer 3)	0-700 Å	100-400 Å	200 Å
ZnO <sub>x</sub> (layer 7)	25-200 Å	40-150 Å	90 Å
Ag (layer 9)	50-250 Å	80-200 Å	130 Å
NiCrO <sub>x</sub> (layer 11)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 13)	0-1,000 Å	500-900 Å	680 Å
ZnO <sub>x</sub> (layer 17)	25-200 Å	40-150 Å	90 Å
Ag (layer 19)	50-250 Å	80-220 Å	168 Å
NiCrO <sub>x</sub> (layer 21)	5-100 Å	15-60 Å	30 Å
SnO <sub>2</sub> (layer 23)	0-500 Å	70-200 Å	125 Å
Si <sub>3</sub> N <sub>4</sub> (layer 25)	0-500 Å	120-320 Å	220 Å

wherein the sheet resistance is more preferred below or equal to 2.8 ohms/sq, (page 4, Tables 1 and 2), having a visible light transmission greater than or equal to 75%, (page 4, Table 3). The titanium oxide of the first layer can be substituted with tin oxide as the antireflective coating, (page 2, section 0038). Laird does not specifically teach silicon nitride should be located under the 1<sup>st</sup> zinc oxide coating.

Lingle et al disclose that silicon nitride and in particular Si-rich silicon nitride function to reduce haze in the final product as well as when used in conjunction with a zinc oxide layer and NiCr oxide layer it can lower the sheet resistance, (page 4, section 0075).

Laird and Lingle et al disclose analogous inventions related to coated substrates which can be used as a monolithic substrate or an IG unit. It would have been within the skill of one in the art at the time of invention to modify the layer structure of Laird with the silicon nitride film of Lingle et al in order to reduce the haze of the coated article as well as lowering the sheet resistance of the coated article, (Lingle, page 4, section 0075).

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*Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn Blackwell whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday; 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gwendolyn A. Blackwell  
Examiner  
Art Unit 1775

  
gab

  
DEBORAH JONES  
SUPERVISORY PATENT EXAMINER